

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
16 December 2004 (16.12.2004)

PCT

(10) International Publication Number
WO 2004/108938 A3

(51) International Patent Classification⁷: **C12N 15/861,**
C07K 7/06, A61K 48/00

(21) International Application Number:
PCT/GB2004/002421

(22) International Filing Date: 7 June 2004 (07.06.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
03 13132.3 6 June 2003 (06.06.2003) GB

(71) Applicant (for all designated States except US): **ICH PRODUCTIONS LIMITED** [GB/GB]; 30 Guilford Street, London WC1N 1EH (GB).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **HART, Stephen, Lewis** [GB/GB]; Institute of Child Health, 30 Guilford Street, London WC1N 1EH (GB). **WRITER, Michele** [GB/GB]; Institute of Child Health, 30 Guilford Street, London WC1N 1EH (GB).

(74) Agents: **SILVESTON, Judith** et al.; Abel & Imray, 20 Red Lion Street, London WC1R 4PQ (GB).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:
12 May 2005

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: PEPTIDE LIGANDS OF DENDRITIC CELLS FOR NUCLEIC ACID VECTOR TARGETING

(57) Abstract: A peptide consisting of or comprising an amino acid sequence selected from a) Px¹X²X³ T [SEQ.ID.NO.:1]; b) PSX⁴S [SEQ.ID.NO.:2]; c) QX⁵X⁶X⁷Q [SEQ.ID.NO.:3]; d) SX⁸S [SEQ.ID.NO.:4], in which X¹, X² and X³, which may be the same or different, each represents an amino acid residue; X² is preferably N or L; X⁴ represents an amino acid residue, preferably N or L; X⁵ and X⁷, which may be the same or different, each represents an amino acid residue, X⁶ represents an amino acid residue having an amide side chain; and X⁸ represent an amino acid having an aliphatic side chain, which peptide binds to dendritic cells and also to other types of cells. The peptide may be used a target non-viral and viral vectors to such cells.

WO 2004/108938 A3

INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB2004/002421

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C12N15/861 C07K7/06 A61K48/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 C12N C07K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	IVANENKOV VASILY V ET AL: "Targeted delivery of multivalent phage display vectors into mammalian cells" BIOCHIMICA ET BIOPHYSICA ACTA, AMSTERDAM, NL, vol. 1448, no. 3, 11 January 1999 (1999-01-11), pages 463-472, XPO02157575 ISSN: 0006-3002	1-15, 30-107
Y	abstract; page 463, right-hand column, lines 3-6; table 1, third peptide	1-15, 30-107
X	WO 98/44121 A (MEHTALI MAJID ; LEGRAND VALERIE (FR); TRANSGENE SA (FR); BOULANGER PIE) 8 October 1998 (1998-10-08) abstract; Seq. ID 1; paragraph joining pages 4 and 5; page 10, lines 14-17; claims 3,6-8,29,33-34	1-15, 30-107
	----- -/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier document but published on or after the International filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
"&" document member of the same patent family

Date of the actual completion of the International search

4 November 2004

Date of mailing of the International search report

01.03.05

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Fausti, S

INTERNATIONAL SEARCH REPORT

Intern: Application No
PCT/GB2004/002421

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 02/057445 A (MURUGANANDAM ARUMUGAM ; STANIMIROVIC DANICA (CA); NARANG SARAM (CA); N) 25 July 2002 (2002-07-25) abstract; table 1, Seq. IDs 61,82; claims 44-47 -----	1-15, 30-107
X	WO 03/004646 A (O'MAHONY DANIEL J ; BRAYDEN DAVID (IE); BYRNE DARAGH (IE)) 16 January 2003 (2003-01-16) abstract; table 4, the 29th peptide on page 50 -----	1-15, 30-107
X	DE 198 45 251 A (UNIV EBERHARD KARLS) 9 March 2000 (2000-03-09) abstract; page 2, lines 21-29; Seq. IDs 1, 39 and 40 on pages 6-7 -----	1-15, 30-107
X	BOER J ET AL: "Design and synthesis of potent and selective alpha(4)beta(7) integrin antagonists" JOURNAL OF MEDICINAL CHEMISTRY, AMERICAN CHEMICAL SOCIETY, WASHINGTON, US, vol. 44, 26 July 2001 (2001-07-26), pages 2586-2592, XP002214393 ISSN: 0022-2623 -----	1-15, 30-34
Y	abstract; page 2586, paragraph joining left- and right-hand columns; tables 1-2 -----	1-15, 30-83, 97-107
X	WO 03/008537 A (CTL IMMUNOTHERAPIES CORP) 30 January 2003 (2003-01-30) abstract; Seq. IDs 393,394,398,399,537,538 of table 1C. -----	1-15, 30-34
X	WO 91/18010 A (INST MEDICAL W & E HALL ; SWINBURNE LTD (AU); MACFARLANE BURNET CENTRE) 28 November 1991 (1991-11-28) abstract; table 2, 4th peptide -----	1-15, 30-34
Y	WO 98/54347 A (HART STEPHEN LEWIS ; INST OF CHILD HEALTH (GB)) 3 December 1998 (1998-12-03) cited in the application abstract; page 5, line 22 to page 10, line 15; claim 47 -----	1-15, 30-83, 97-107
Y	WO 02/072616 A (ICH PRODUCTIONS LTD ; WRITER MICHELE (GB); HART STEPHEN LEWIS (GB)) 19 September 2002 (2002-09-19) abstract; page 5, lines 2-7; examples 1-2; claims 21-81 -----	1-15, 30-107
	----- -/--	

INTERNATIONAL SEARCH REPORT

Intern: I Application No
PC1/GB2004/002421

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>WO 01/58940 A (GENVEC INC) 16 August 2001 (2001-08-16) abstract; example 1; page 5, first paragraph; page 6, second paragraph, paragraph joining pages 6 and 7 -----</p>	
A	<p>PEREBOEV A V ET AL: "Coxsackievirus-adenovirus receptor genetically fused to anti-human CD40 scFv enhances adenoviral transduction of dendritic cells." GENE THERAPY. SEP 2002, vol. 9, no. 17, September 2002 (2002-09), pages 1189-1193, XP002303755 ISSN: 0969-7128 abstract; figures 1 and 3 -----</p>	

INTERNATIONAL SEARCH REPORT

In

onal application No.
PCT/GB2004/002421

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
Although claims 97, 99-101 and 108 are directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition. In particular, the method of claim 108 is to be considered as such because it can be carried out "in vivo".
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1 (partially), 2-15, 30-107 (partially)

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International Application No. PCT/ GB2004/ 002421

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1 (partially), 2-15, 30-107 (partially)

Peptides comprising the motif of Seq. ID 1 (i.e. PXXXT), compositions and medical uses thereof, as well as antibodies and methods for producing said compositions: transfection mixtures, complexes, vectors, kits,...

2. claims: 1 (partially), 16-20, 30-107 (partially)

Peptides comprising the motif of Seq. ID 2 (i.e. PSXS), compositions and medical uses thereof, as well as antibodies and methods for producing said compositions: transfection mixtures, complexes, vectors, kits,...

3. claims: 1 (partially), 21-25, 30-107 (partially)

Peptides comprising the motif of Seq. ID 3 (i.e. QXXXQ), compositions and medical uses thereof, as well as antibodies and methods for producing said compositions: transfection mixtures, complexes, vectors, kits,...

4. claims: 1 (partially), 26-29, 30-107 (partially)

Peptides comprising the motif of Seq. ID 4 (i.e. SXS), compositions and medical uses thereof, as well as antibodies and methods for producing said compositions: transfection mixtures, complexes, vectors, kits,...

5. claim: 108

Method for the identification of siRNAs.

INTERNATIONAL SEARCH REPORT

Information on patent family members

Interr

Application No

PC1/GB2004/002421

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9844121	A	08-10-1998	FR 2761688 A1	09-10-1998
			FR 2761689 A1	09-10-1998
			AU 741728 B2	06-12-2001
			AU 7054798 A	22-10-1998
			CA 2285565 A1	08-10-1998
			EP 0991763 A1	12-04-2000
			WO 9844121 A1	08-10-1998
			JP 2001522236 T	13-11-2001
			US 6569677 B1	27-05-2003
			US 2003175243 A1	18-09-2003
WO 02057445	A	25-07-2002	AU 6885501 A	03-12-2001
			WO 0190190 A2	29-11-2001
			WO 02057445 A1	25-07-2002
			CA 2380443 A1	29-11-2001
			CA 2441903 A1	25-07-2002
			EP 1328626 A1	23-07-2003
			US 2003190598 A1	09-10-2003
			US 2004161738 A1	19-08-2004
WO 03004646	A	16-01-2003	CA 2443644 A1	16-01-2003
			EP 1419252 A2	19-05-2004
			WO 03004646 A2	16-01-2003
			US 2003211476 A1	13-11-2003
			CA 2451741 A1	16-01-2003
			EP 1432729 A2	30-06-2004
			WO 03004517 A2	16-01-2003
			US 2003096354 A1	22-05-2003
DE 19845251	A	09-03-2000	DE 19845251 A1	09-03-2000
			WO 0014215 A1	16-03-2000
			EP 1109897 A1	27-06-2001
WO 03008537	A	30-01-2003	CA 2442386 A1	17-10-2002
			EP 1383528 A2	28-01-2004
			WO 03008537 A2	30-01-2003
			WO 02081646 A2	17-10-2002
			US 2003220239 A1	27-11-2003
			US 2003138808 A1	24-07-2003
WO 9118010	A	28-11-1991	AU 7869191 A	10-12-1991
			WO 9118010 A1	28-11-1991
WO 9854347	A	03-12-1998	AU 7667398 A	30-12-1998
			CA 2288840 A1	03-12-1998
			EP 1003898 A1	31-05-2000
			WO 9854347 A1	03-12-1998
			JP 2002502243 T	22-01-2002
			US 2003013644 A1	16-01-2003
			US 2002042384 A1	11-04-2002
WO 02072616	A	19-09-2002	CA 2470152 A1	19-09-2002
			EP 1368371 A2	10-12-2003
			WO 02072616 A2	19-09-2002
			JP 2004532197 T	21-10-2004
			US 2004132973 A1	08-07-2004
WO 0158940	A	16-08-2001	AU 3498101 A	20-08-2001

Information on patent family members

PC1/UB2004/002421

16-08-2001
29-11-2001